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## ALTA AVALANCHE STUDY CENTER

Miscellaneous Report No. 4

## AVAILABILITY OF THE RAM PENETROMETER (HAEFELI RAMMSONDE) IN THE UNITED STATES

R. M. Stillman Avalanche Hazard Forecaster (Arapahoe National Forest)



During the winter of 1961-62 several people expressed an interest in obtaining a penetrometer for use at various points in the Western United States.

In making inquiries it was found that very few work prints were available. Work prints that were available were in the metric system and most of the machine shops contacted in this area were reluctant to attempt to construct a penetrometer by using the metric prints. Also, the list of materials was composed of stock carried in a foreign country where the penetrometer originated - Switzerland.

Therefore, in an attempt to make the construction of a penetrometer easier and more compatable to our machine shops, a local (Denver) firm was commissioned to make three penetrometers and at the same time make new work drawings converting, wherever possible, all metric figures to the English system. Also, it was requested that a list be compiled of materials easily obtainable from stock common to any machine shop in the United States.

A basic penetrometer is considered to be composed of the following items:

- A. 1 Kilogram Ram
- B. 2 Kilogram Ram
- C. 1 Guide Rod Assembly
- D. 1 Section, with Cone End (Lead Rod)
- E. 2 Additional Sections (Extension Rods)

By submitting the work drawings to a machine shop the above basic penetrometer will cost approximately \$175.00. Price quoted by K-F Products, Denver, Colorado, F.O.B. Denver.

Additional sections (following rods), if needed, will cost extra.



This report serves notice that anyone interested in constructing or ordering construction of a ram penetrometer may obtain a copy of the English-system blueprints mentioned above by contacting R. M. Stillman, Arapahoe National Forest, Golden, Colorado.

A complete ram penetrometer of slightly different mechanical construction but identical in operation may be purchased from the Testlab Corporation, 564 West Monroe Street, Chicago 6, Illinois. This penetrometer includes 4 1-meter extensions, 1- and 3-kg ram weights, and a canvas carrying case. Latest price quotation is \$365.00.